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U.S. Market Structure: The Dairy Industry in the 21st Century

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The U.S. dairy industry is undergoing major structural changes due to the following factors:

- Farms are consolidating due to competition and opportunity,
- The milk supply continues to increase to meet consumer demand,
- Cheese demand may be leveling off, just as imports appear to be increasing,
- Milk can be transported longer distances,
- Some government programs are becoming more market oriented, others are not,
- Consumers want more selection, convenience and quality at affordable prices, and
- Processors and retailers are increasingly focusing on consumer needs.

Farm Numbers and Location

Despite an increase in the milk supply in the U.S., farm numbers continue to decline and the remaining farms are getting bigger.

For example, milk production increased from 153.6 billion pounds in 1995 (676 million hectoliters) to 165.3 billion pounds in 2001 (727 million hectoliters).² At the same time, cow numbers fell from 9.5 million head in 1994 to 9.1 million head in 2001. Thus productivity on a per cow basis increased 12.5 percent over this time period.

Over the period 1993-2001, every farm size category declined except those with 200 cows and above (see Table 1). Farm operations--the official USDA measure of all dairy farms with at least one milking cow--declined 39 percent over the period 1993-2001, from 159,450 farms in 1993 to 97,560 farms in 2001. That said, farm operations with 200 cows or more actually grew 14.3 percent over this period. By 2001, these farms accounted for 57 percent of all the milk produced in the U.S.

Milk production is also changing regionally in the United States. For example, the western regions of California, the Northwest and Mountain States grew 21-140 percent each over the period 1990-2001 (see Table 2). On the other hand, the Northeast grew a

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² Assuming 1 hectoliter of milk equals 227.2727 pounds

Table 1. Change in Dairy Farm Structure, 1993-2001

	No. Farm Operations 1/ %			Percent of Milk by Herd Size	
	1993	2001	change	1993	2001
1-29	59,250	28,155	-52.5	4.1	1.6
30-49	35,390	19,865	-43.9	13.1	6.7
50-99	42,950	29,215	-32.0	27.6	18.2
100-199	14,900	12,335	-17.2	18.9	16.5
200+	6,990	7,990	14.3	36.3	57.0
Total	159,480	97,560	-38.8	100.0	100.0

1/ Operations with one or more cows.

Source: USDA, NASS. "Milk Production." Various issues.

Table 2. Regional Shifts in U.S. Milk Production, 1990-2001

	1990		2001		% change 1990-2001
	mil lbs	mil hl 1/	mil lbs	mil hl 1/	
Northeast	27,142	119.4	28,786	126.7	6.1
Corn Belt	17,037	75.0	14,633	64.4	-14.1
Upper Midwest	39,663	174.5	36,866	162.2	-7.1
Northern Plains	5,404	23.8	4,990	22.0	-7.7
Appalachia	8,248	36.3	6,284	27.6	-23.8
Southeast	4,926	21.7	4,509	19.8	-8.5
Delta States	2,506	11.0	1,561	6.9	-37.7
Southern Plains	6,784	29.8	6,392	28.1	-5.8
N. Mountain States	3,399	15.0	8,166	35.9	140.3
S. Mountain States	6,087	26.8	12,546	55.2	106.1
Northwest	6,003	26.4	7,231	31.8	20.5
California	20,947	92.2	33,251	146.3	58.7
Alaska & HI	168	0.7	120	0.5	-28.3
Total U.S.	148,313	652.6	165,335	727.5	11.5

Note: hl = hectoliters. One hectoliter of milk = 227.2727 pounds.

Source: USDA, NASS. "Milk Production." Various issues.

modest 6.1 percent. The Upper Midwest, a traditionally a surplus milk region for the U.S., declined 7.1 percent.

Currently milk production is centered in three major milk producing regions:

- The Northeast (New York, Pennsylvania, and Vermont)
- Midwest (Minnesota, Wisconsin, Michigan, Iowa and Ohio)
- West:
 - California
 - Other West (Washington, Oregon, Idaho, New Mexico, and Arizona)

Together, these major milk producing states accounted for 76.8 percent of the milk produced in 2001.

Farm sizes are typically larger in the Western States. For example, in 2001, the average herd size in California and Idaho was 636 and 366 cows, respectively (Table 3). That compares with an average herd size of 58 cows in Pennsylvania and 68 cows in Wisconsin. Newer operations built in the West typically average around 3,000 cows.

Table 3. Comparison of Average Herd Sizes by Region, 2001.

	Cow Numbers	No. Farm Operations	Average Herd Size
	1000 hd		
California	1,590	2,500	636
Idaho	366	1,000	366
Pennsylvania	599	10,300	58
Wisconsin	1,292	19,100	68
U.S.	9,115	97,560	93

Source: USDA, NASS. "Milk Production." Various issues.

A quote from a new USDA report that discusses trends in U.S. milk production may better explain the discussion so far, "Dairy farms continue to grow, become more concentrated in certain regions, and become more specialized in producing milk. However, small traditional dairy operations remain scattered around the country." (see Blayney 2002).

Trends in Consumption

Consumption of all milk products (milk equivalent, butterfat basis) has increased an average 1.8 percent per year from 1990 to 2001. On a per capita basis, milk equivalent consumption has grown from 568 pounds in 1990 (257.6 kilograms) to 588 pounds in 2001 (266.7 kilograms).³

³ One kilogram is equal to 2.2046 pounds.

The growth in dairy consumption over this time period has not been equally distributed among all dairy products. Taking a longer view, Figure 1 clearly illustrates that while per capita consumption of all dairy products (milk equivalent) grew 9.1 percent over the period of 1975-2001, per capita consumption of fluid milk products declined 20.7 percent.

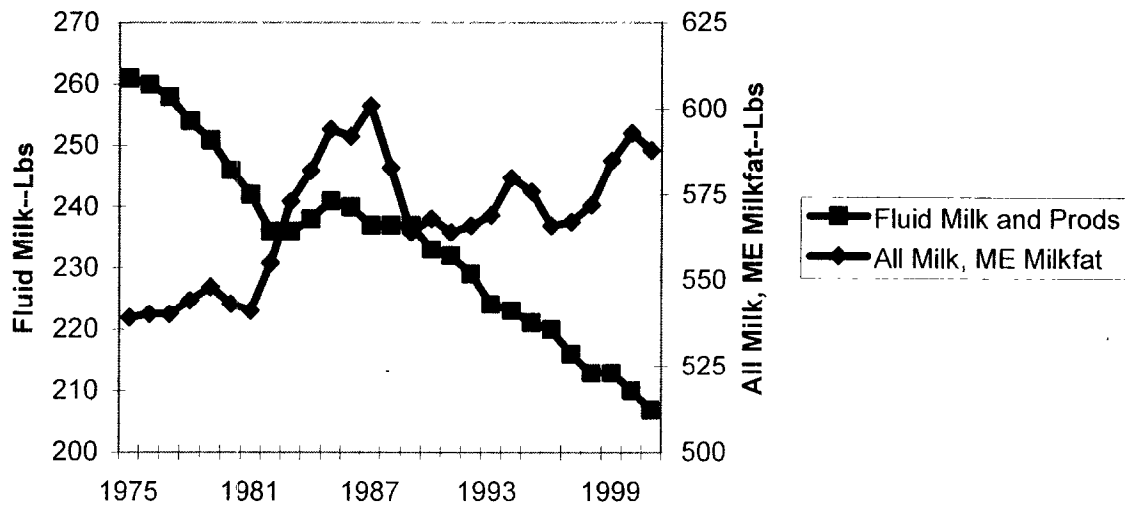


Figure 1. Per Capita Consumption: All Milk and Fluid Products, 1975-2001

There are three consumer trends underway in the United States. First, consumer demand for fluid milk has declined over time because the product has not remained competitive with other beverages in terms of packaging, convenience, or advertising. For example, orange juice today comes in a plastic container with a convenient handle, a label with colorful graphics, and is supplemented with calcium, vitamin E and other “health” ingredients. Fluid milk, on the other hand, often does not mention it is an excellent source of calcium. Milk consumption may also be the victim of changes in lifestyles. There is a definite downward trend in cereal consumption; many consumers today are either skipping breakfast all together, or are getting it in a fast food line.

A second consumer trend is the explosive growth in fast food. The U.S. dairy industry has been fueled over the past 20 years by cravings for both pizza and fast food products that contain lots of cheese, butter and cream products. The demand for mozzarella cheese has diverted a lot of milk away from surplus uses (i.e. butter and nonfat dry milk) into a strong consumer category. Per capita consumption of “other cheese,” which is mainly mozzarella, grew from 6.1 pounds in 1975 (2.8 kilograms) to a peak of 17.1 pounds (7.8 kilograms) in 2000 (Figure 2). Since then it has leveled off. Demand for American cheese, a favorite in fast food restaurants, also grew over time, but not nearly as much as

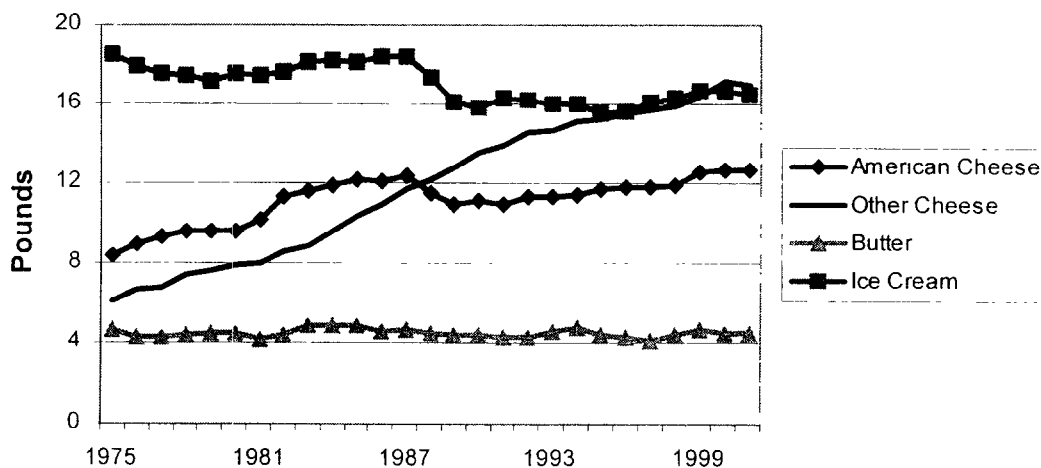


Figure 2. Per Capita Consumption: Demand for Milkfat, 1975-2001

mozzarella cheese. Per capita consumption of American cheese grew from 8.4 pounds in 1975 (3.8 kilograms) to 12.7 pounds in 2000 (5.8 kilograms).

The demand for other high fat items has not kept pace with the demand for cheese. Ice cream and butter consumption on a per capita basis has been relatively stable over time, although there has been a slight increase in the demand for lower fat ice cream products.

The third trend, which is related to the second trend, is convenience. Consumers want more selections, better packaging, faster meal preparation times, etc. For example, the latest trends for consumers in the U.S. is selling lunch items that can be consumed without a napkin or eating utensils (i.e. yogurt in a plastic tube). In fact, it's not uncommon for someone to have consumed their "lunch" before they reach the convenience store cash register.

The U.S. dairy industry will face declining demand for dairy products if they do not reverse the negative trend in fluid milk consumption. Also, it is inevitable that growth in per capita consumption for cheese will eventually slow down. In fact, it is very likely that we have already reached this stage. There are reports that growth in the U.S. fast food industry has already peaked out. The issue for the future is whether the U.S. dairy industry can successfully compete with other food processors to successfully tap into changing consumer trends for convenience, taste, selection, and superior packaging.

Evolution of Dairy Commodity Markets

The price of milk that U.S. dairy farmers face is much more volatile today than in the mid-1980's. In fact, milk prices can now swing from record highs to record lows in a

matter of months. And, the volatility in milk prices has been increasing over time (see Figure 3). This is due to the reduction in the support price for milk, and the emergence of dairy commodity markets driven by market forces.⁴

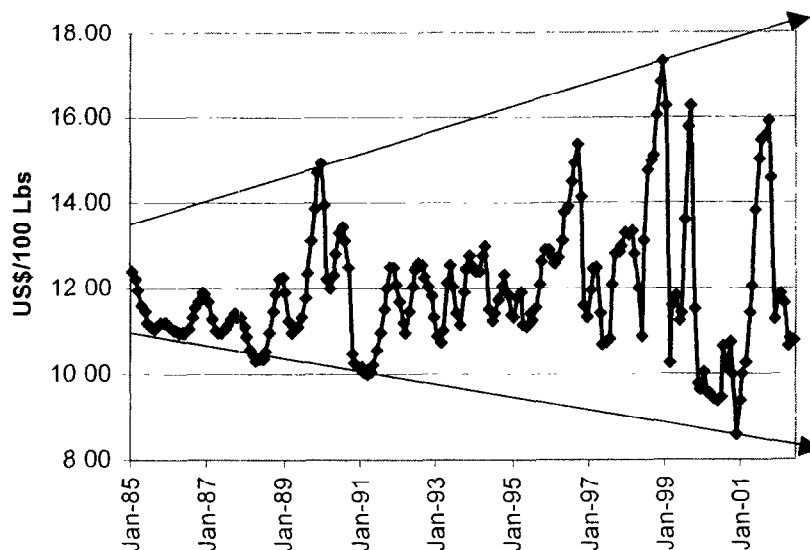


Figure 3. Volatility in the Federal Order Class III Price of Milk Used for Cheese Production

The support price for milk fell from over \$13 per hundred pounds of milk in the mid-1980's to just \$9.90 in recent years (at 3.67 percent butterfat). In the absence of government intervention, the markets have taken over and thus supply and demand factors are now important in determining dairy commodity prices. In fact, the wholesale prices for dairy commodities such as butter, nonfat dry milk, and cheese are important since they drive formula prices under federal and state milk marketing orders (more about this later).

One of the biggest changes in the U.S. dairy industry is the recent development of cash and futures markets for dairy commodities, namely butter and cheese. Butter and cheese trades in open markets at the Chicago Mercantile Exchange. Cheese in 40-pound blocks and barrel cheese (500 pounds) trade daily; Grade AA butter trades three times per week. Information regarding these commodity prices are readily available on the internet (<http://www.cme.com>). In addition, USDA has an excellent weekly market summary that is available online, the *Dairy Market News* report (<http://www.ams.usda.gov/dairy/mnncs/weekly.htm>).

⁴ For more information on dairy markets and outlook, see my weekly dairy market report, <http://dairyoutlook.aers.psu.edu/>

In addition to the cash markets, the Chicago Mercantile Exchange also provides dairy futures contracts that are growing in use over time. Currently there are dairy futures contracts for Class III milk (milk used to make cheese), Class IV milk (milk used to make butter and nonfat dry milk), and for butter and cheese commodities. There is also a contract for nonfat dry milk, but it is inactive since U.S. nonfat dry milk prices have been at support levels for many years now.

Federal Farm Policy

Wholesale milk prices in the United States are determined by a combination of government intervention and market forces. For example, milk prices this spring sank to relatively low levels due to an abundance of milk and weak market demand. Government policy intervened to prevent milk prices from falling further by purchasing surplus nonfat dry milk.

Traditionally government intervention in the U.S. dairy industry has been the following:

- Dairy price support program,
- Federal and state milk marketing orders, and
- Direct government payments

Dairy Price Support Program

The purpose of the dairy price support program has been to support the manufacturing value of milk. The theory goes that support for manufacturing milk will support the farm price of milk. Currently the support price of milk is \$9.90 per 100 pounds of milk at 3.67 percent butterfat. The government does this by standing ready to purchase unlimited quantities of dairy commodities (butter, nonfat dry milk and cheese) at Commodity Credit Corporation (CCC) purchase prices, which are linked to the \$9.90 support price.

The \$9.90 support price was set by the Congress. In fact, the dairy price support program was recently extended in the 2002 Farm Bill. The current CCC purchase prices for dairy commodities are as follows: \$0.8548 per pound for bulk butter, \$1.1314 per pound for 40-pound block cheese, and \$0.90 per pound for nonfat dry milk. This information and weekly purchases of dairy products under the support price program can be found on the last page of the weekly report ***Dairy Market News*** (<http://www.ams.usda.gov/dairy/mncls/weekly.htm>).

There are economic formulas that determine the CCC purchase prices for cheese, butter and nonfat dry milk in relation to the \$9.90 support price for manufacturing milk. The formulas are basically the Class III and Class IV formulas under federal milk marketing orders (see Federal Orders below). Essentially, the support price for \$9.90 for milk is substituted for the Class III and IV value, and then solved for cheese, butter and nonfat dry milk prices.

The formulas are below:

Assume a milk support price of \$9.90 per 100 pounds of milk at 3.67 percent butterfat.

$$\begin{aligned}\text{Class IV (3.67\% bf)} &= \text{Class IV skim milk} \times 0.9633 + \text{Class IV butterfat price} \times 3.67^5 \\ &= [(\text{NASS nonfat dry milk price} - 0.14) \times 9] \times 0.9633 \\ &\quad + [(\text{NASS AA butter price} - 0.115) / 0.82] \times 3.67 \\ &= \text{NASS nonfat dry milk price} \times 8.6697 \\ &\quad + \text{NASS AA butter price} \times 4.4756 - 1.7285\end{aligned}$$

If one assumes a nonfat dry milk support price of \$0.90 per pound (CCC purchase price), one can solve the above equation to derive a CCC purchase price for butter of \$0.8548 per pound. In addition, the formula above can be used to “tilt” the support price of butter/nonfat dry milk. For example, if the USDA decides to reduce the CCC purchase price of nonfat dry milk to say \$0.80 per pound, the new higher CCC purchase price of butter can be determined with the formula above.

$$\begin{aligned}\text{Class III (3.67\% bf)} &= \text{Class III skim milk} \times 0.9633 + \text{Class III butterfat price} \times 3.67^6 \\ &= [((\text{NASS cheese price} - 0.165) \times 1.405) \times 3.1 \\ &\quad + ((\text{NASS dry whey} - 0.14) / 0.968) \times 5.9] \times 0.9633 \\ &\quad + [(\text{NASS cheese price} - 0.165) \times 1.582] \times 3.67 \\ &= \text{NASS cheese price} \times 10.0015 \\ &\quad + \text{NASS dry whey} \times 5.8714 - 2.4723\end{aligned}$$

Again, assuming a milk support price of \$9.90 and a dry whey price of \$0.18 per pound, one can solve for the block cheese support price of \$1.1314 per pound. Barrel cheese, which has less packaging requirements, is assumed to be 3 cents per pound lower than block cheese.

Federal Milk Marketing Orders

Federal milk marketing orders use the principles of pooling (equalization of farm payments) and classification (alternative prices for different end uses for milk) to support the farm price of milk. Federal orders have been the cornerstone of milk pricing in the U.S. since they were first used in the early 1930s.

That said, federal orders have undergone a number of changes over the years. There have been changes in the number of milk classes over time, as well as the pricing formulas used. For example, the value of manufacturing milk used in all federal orders was tied to

⁵ The formula used to calculate the support price for butter and nonfat dry milk was the one implemented in a federal injunction (see Bailey, February 23, 2001).

⁶ The formula used to calculate the support price for cheese is the initial federal order formula issued by USDA under the order reform process prior to the federal injunction (See Bailey, January 2001).

a survey of dairy plants in the Upper Midwest starting in the early 1960s. The survey price was called the Minnesota-Wisconsin price, of M-W for short, which was then updated to the Basic Formula Price (BFP). That was changed under federal order reform in January 2000 when the BFP was replaced by an economic formula that used make allowances and yield factors and wholesale prices for cheese, butter, nonfat dry milk, and whey to determine federal order class prices. The new formulas do not use a plant survey.

Federal order reform initiated a number of critical changes in federal milk marketing orders. The number of orders was reduced from 31 to just 11 orders. The old Basic Formula Price was finally replaced. In fact, the new system employed a true multiple component pricing (MPC) system in many federal orders. The Class I pricing structure which set minimum prices that processors had to pay for bottling milk in major cities was modified slightly. Four classes of milk were developed.

Under classification, Class I is for milk used for bottling purposes, Class II is milk used for soft manufactured products, Class III is for milk used to make cheese, and Class IV is for milk used to make butter and nonfat dry milk.

The real benefit of federal order reform was that it effectively “modernized” the dairy industry to a large extent. The MPC pricing system sent producers correct market signals in terms of what the market valued. Some orders even instituted premium structures for Somatic Cell Count.

To illustrate the relationship between federal milk marketing orders and the farm price of milk, let’s use the Northeast federal order and the computation of the May 2002 uniform price (Table 4). The Northeast federal order is a geographic region that stretches from Maine to Washington D.C., and as far West as central Pennsylvania. Approximately 39.8 percent of the milk marketed in this federal order in May 2002 was used for fluid purposes, and the balance for yogurt and ice cream (15.0 percent), cheese production (31.3 percent), and butter and nonfat dry milk (13.9 percent).

Table 4. Computation of the May 2002 Statistical Uniform Price for the Northeast Federal Order No. 1

Class	Class Use	Class Price
	%	\$/100 Pounds
Class I	39.8	14.51
Class II	15.0	11.29
Class III	31.3	10.82
Class IV	13.9	10.57
Statistical Uniform Price		12.63

Source:

http://www.fmmone.com/Northeast_Order_Prices/New_Prices_main.htm#Uniform

The Class I – IV federal order prices were determined via multiple component pricing formulas (see Bailey February 2001). The advance pricing factors used in the computation of the Class I and II formulas are announced each month at the following URL: <http://www.ams.usda.gov/dyfmos/mib/advanprc.pdf>. The component prices and Class III and IV prices are announced each month at the following URL: <http://www.ams.usda.gov/dyfmos/mib/classprcacnmt.pdf>. And finally, the exact formulas used to compute the federal order class prices are here: http://www.ams.usda.gov/dairy/price_formula_2001.htm.

Dairy farmers receive a blend of these prices. The May 2002 statistical uniform price of \$12.63 per 100 pounds of milk is an approximation of the price farmers actually receive. There are two modifications to this price before it reaches a producers mailbox. First, the uniform price, or blend price, is “zoned” from Boston to the plant a producer delivers their milk to. For example, a dairy producer in Lancaster, Pennsylvania receives \$0.35 per 100 pounds of milk less than a dairy producer theoretically located in downtown Boston, Massachusetts. Second, the farm price is adjusted for component levels. Dairy producers located in MPC orders receive a Class III value based on the percentage of butterfat, protein, and other solids tested for in their milk.⁷ They also receive an adjustment called the Producer Price Differential, or PPD, which together with the Class III value and the location adjustment approximates the uniform or blend price. Component levels in this system are important since producers who ship milk with butterfat and protein levels above 3.5 and 2.9 percent, respectively, will receive an average farm price greater than the reported statistical uniform price.

For more information on federal milk marketing orders, see USDA’s website: <http://www.ams.usda.gov/dairy/index.htm>

Direct Payments

A third level of support for dairy producers in the U.S. is direct payments. In the past these have been limited to Dairy Market Loss Payments that were made by the Congress. These were typically made during a period of low milk prices, an election cycle, or both.

In June 1999, USDA’s Farm Service Agency announced that \$200 million in direct payments would be distributed to dairy farmers for Dairy Market Loss Payments. The payments were limited to the first 2.6 million pounds of milk production per farm operation in either 1997 or 1998. The payment rate was \$0.225 per 100 pounds of milk (US\$ 0.5625 per hectoliter).

In April 2000, USDA’s Farm Service Agency announced another round of the Dairy Market Loss Payment program. USDA was expected to make payments of \$122.6 million. Like the first round, it was limited to the first 2.6 million pounds of milk produced from each farm operation. The payment rate was \$0.132 per 100 pounds of milk (US\$ 0.30 per hectoliter).

⁷ For more information on the farm price of milk, see Bailey (2000).

The Dairy Market Loss Payment program was replaced with a new 3.5-year program in the 2002 Farm Bill (see below).

Major Dairy Provisions in the 2002 Farm Bill

The latest U.S. farm bill represents a significant departure from the last farm bill that embraced the “Freedom to Farm” concept. The idea then was to phase out government involvement in producer decisions and transition to a “free market.” Troubles began almost immediately with a downturn in global grain prices.

Farm Bill Background

As was the case in prior farm bill deliberations, dairy policy was an intense area for debate. The 1996 Farm Bill involved discussion on federal order reform. In addition, the final legislation allowed the creation of a Northeast Interstate Dairy Compact (Northeast Compact). The Northeast Compact, which expired last year, became a major area of contention in the debate for the new Farm Bill.

The Northeast Compact essentially created an exception to interstate trade for the New England dairy industry. The Commerce Clause in the U.S. Constitution states that only Congress has the authority to regulate interstate commerce. There is an exception to interstate trade, however, in the Compact Clause. It allows a group of 2 or more states to get together and essentially “avoid” interstate trade. Our founding fathers inserted the Compact Clause in the U.S. Constitution to allow states to deal with border disputes and other administrative issues that were not of interest to the other states.⁸

The Northeast Compact essentially allows a citizen’s panel (called the “Compact commission”) to set a floor on the Class I (fluid) value for milk. All fluid milk processors located in six New England states were required to not only pay the fixed minimum price for fluid milk, but they also had to pay for the administrative costs of running the Compact commission.

The Northeast Compact operated by collecting the difference between the Class I floor of \$16.94 per 100 pounds of milk (US\$ 38.5 per hl) and the minimum Class I federal order price in Boston. If the latter was higher than the former, no payment was collected. The Compact commission then pooled the proceeds with all milk sales in the Northeast federal order (multiplied the payment collected from processors by the Class I utilization rate), and then distributed the proceeds back to all dairy producers who participated in the program.

The big issue in the Farm Bill debate was whether the Congress was going to extend the Northeast Compact, and expand it beyond the New England border. There was much interest in forming Mid-Atlantic, Southern, Northwest, and Mountain state compacts.

⁸ For more information on the Compact Clause, see Bailey (April 2002a).

The idea was scrapped after much protest from the Upper Midwest and from fluid milk processors.

Major Dairy Provisions

The major dairy features of the new 2002 Farm Bill are as follows:⁹

- Extend the life of the dairy price support program,
- Create a new National Dairy Market Loss Payment program,
- Authorize a new national Johne's disease control program,
- Require dairy importers to pay an assessment for dairy promotion that is equivalent to what domestic producers pay,
- Increase funding for dairy and other livestock producers under the Environmental Quality Incentives Program (EQIP),
- Extend the life of the Dairy Export Incentive Program (DEIP),
- Increase Market Access Program (MAP) funds,
- Improve the statutory mandatory inventory and price reporting language to help prevent reporting errors by USDA, and
- Extend the Fluid Milk Promotion program.

The Milk Price Support Program, which was set to expire May 31, 2002, is now extended through to December 31, 2007. The program supports the price of milk through the purchase of cheese, butter, and nonfat dry milk.

The price of milk will be supported at \$9.90 per 100 pounds of milk (US\$ 22.5 hl) for milk containing 3.67 percent butterfat. The support price for milk will then determine the Commodity Credit Corporation (CCC) purchase prices for cheese, butter, and nonfat dry milk. The legislation notes, "the purchase prices shall be sufficient to enable plants of average efficiency to pay producers, on average, a price that is not less than the rate of the support for milk in effect."

The National Dairy Market Loss Payment Program (NDMLP) represents a new direction in support to the dairy industry. The idea behind the NDMLP was to provide small family dairy farmers with a deficiency payment whenever market prices fell below a threshold level. In essence, it is similar to a combination of the Northeast Interstate Dairy Compact and the old Dairy Market Loss Payment programs (DMLP). While the new program is national, it uses many of the parameters from the Northeast Compact. And, it is a targeted program, much like the DMLP program. In other words, not all of the milk produced in the U.S. will qualify for the payments.

A monthly payment will be made to producers whenever the announced Class I price of milk in Boston falls below \$16.94 per 100 pounds (US\$ 38.5 per hl). The payment rate will then be equal to 45 percent of this difference. For example, in May 2002 the announced Class I price for fluid milk in Boston was \$14.51 per 100 pounds (US\$ 33 per

⁹For a detailed review of these dairy provisions, see Bailey and Abdalla, and Jesse and Cropp.

hl). The difference between this and \$16.94 is \$2.43, or US\$ 5.5 hl (\$16.94 - \$14.51). The payment rate will then be equal to 45 percent of this difference, or \$1.09 per 100 pounds (US\$ 2.5 hl). For more information on the monthly calculation of these payments, see http://www.fmmone.com/Northeast_Order/DMLP%20calculator/DMLP.htm .

The dairy deficiency payments are limited to just 2.4 million pounds of milk per farm operation for a given fiscal year (or 10,560 hl). This is equivalent to the annual output from a farm with 133 cows producing 18,000 pounds of milk per cow. The exact legal definition of a dairy farm operation, and the parameters for participating in this program have not yet been announced by USDA's Farm Services Agency. Under the program, the current fiscal year is retroactive back to December 1, 2001 through September 30th. That's just 10 months for the first fiscal year. A lump sum payment will likely be made to eligible dairy producers for this period, with monthly payments available thereafter.

For the full text of the farm bill, including a manager's report, see the following URL: <http://agriculture.house.gov/fbconftrpt.htm> .

Economic Impact of the 2002 Farm Bill

The new U.S. Farm Bill has created a firestorm of controversy both here in the U.S. and abroad. Members of the press who generally don't understand agriculture and have little understanding of dairy have been highly critical of the overall cost of the new farm bill. The general reporting is that the Farm Bill will cost \$170-\$190 billion over 10 years, depending on who was writing the story.

The Congressional Budget Office baseline as of March 2002 indicated that the cost of operating Commodity Credit Corporation operations for price support, export credit, and conservation programs would be \$63.6 billion over the fiscal years 2002-2006. The additional cost of the Title I commodity programs and the Title II Conservation programs under the new Farm Bill (called the CBO "score") would be \$35.9 billion.¹⁰ Thus the total annual cost of the commodity and conservation titles over the first 5 years would average \$16.6 billion per year.

It is my estimation that spending of this level would have no discernable impact on U.S. commodity production, and would not affect our trading partners (just kidding!). Seriously, we know that as economists such spending could have market impacts in the U.S. and beyond our borders. There is already analysis underway to quantify this.

What impact will the dairy programs have on the U.S. market? The CBO score indicated that the annual average cost of extending the milk price support program and developing the new dairy deficiency payment program would be just \$86 and \$193 million per year, respectively. Both of these numbers appear to be on the "low side" of market expectations. That's because the March 2002 CBO baseline was relatively optimistic regarding U.S. market prices. For the first nine months of the current 2002 fiscal year,

¹⁰ The commodity programs alone were expected to cost \$31.1 billion for fiscal years 2002-2006.

USDA purchased 531.8 million pounds of nonfat dry milk.¹¹ Given a CCC purchase price of \$0.90 per pound, that should have cost USDA about \$478.6 million, which does not include storage costs. Clearly this figure is much higher than CBO expectations.

This author estimated (seriously!) that the cost of the dairy deficiency payment program would be \$740 million the first partial fiscal year (December 2001 – September 2002) assuming an average payment rate of \$0.97 per pound, or US\$ 2.2 per hl (Bailey and Abdalla). Thereafter, the program cost will average \$540 million per year at an annual average payment rate of \$0.57 per pound (US\$ 1.3 per hl).

The Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri estimated that the 2002 Farm Bill would increase milk production 0.9 billion pounds (4 million hl) and reduce the all-milk price by an average \$0.25 per 100 pounds (US\$ 0.57 per hl) over the fiscal years 2002-2006. This is a fairly significant reduction in the price of milk. In fact, I would expect this price impact is on the high side of analyst expectations. That's because smaller dairy producers will likely expand less than larger producers when it comes to a per unit subsidy. Also, a \$500 million per year dairy program is a small amount of cash compared to the \$21-\$26 billion in cash receipts that farmers normally receive for their milk production.

Import Controls and International Trade

The U.S. dairy industry is subject to international trade agreements under the Uruguay Round of the General Agreements on Tariffs and Trade. This agreement created the World Trade Organization. A new WTO round has already begun.¹²

The WTO had two major impacts on the U.S. dairy industry. First, it limited our use of subsidized exports of dairy products under the Dairy Export Incentive Program. Second, it converted our quota program on dairy imports to tariff rate quotas.

There are three major issues regarding international trade, U.S. commitments to the WTO, and the U.S. dairy industry. They are:

- Subsidized exports of dairy products from Canada,
- U.S. imports of dairy products with little or no tariffs (butter blends and MPC), and
- Budget expenditures under the 2002 Farm Bill.

The first issue is an ongoing dispute between Canada and the U.S. in terms of what constitutes subsidized exports of dairy products and whether they are subject to WTO limits. Surprisingly, both countries have sizable dairy industries and are major trading partners in dairy products (see Bailey April 2002b).

¹¹ Source: USDA, Agricultural Marketing Service, "Dairy Market News," vol. 69, report 26, June 24-28, URL: <http://www.ams.usda.gov/dairy/mnacs/weekly.htm>.

¹² For more information on the WTO and Agriculture, see the USDA report (USDA, FAS 2002).

The second issue is one that has been simmering for the last few years. Dairy producer organizations, notably the National Milk Producers Federation (www.nmpf.org) and the Alliance of Western Milk Producers claim that imports of milk proteins in the form of Milk Protein Concentrates (MPC's) and butter blends (mixed with other milk solids, salt, and/or sugar) are circumventing our tariff rate quota system. They also claim that MPC imports have substituted for domestically produced nonfat dry milk, which is now entering government warehouses at an alarming rate. Many of these dairy products are entering the U.S. with very low tariffs. These two organizations are proposing that Congress create new tariffs for these dairy products in order to stem the flow of imports.¹³

Food processors in the U.S., on the other hand, claim that creating new tariffs will raise food processing costs, and that products like MPC are new products that have functional properties that can't be substituted with domestically produced nonfat dry milk (see IDFA). One can also hypothesize that some members of Congress may be concerned that imposing new tariffs on MPC, casein, and butter blends might invite trade retaliations from our trading partners. There are already international tensions related to U.S. positions on steel and lumber imports.

The final issue surrounds U.S. agricultural policy and our world trade commitments. The question is, will spending under the new 2002 Farm Bill be compatible with the WTO?

According to a USDA fact sheet on U.S. agriculture and the WTO (see USDA/FAS, Jan. 2002),

Governments provide internal support to their producers in many ways. Some of these policies have significant consequences beyond a country's borders. Such policies can impose costs on other countries and world markets by encouraging overproduction or inducing production of specific commodities. Under the WTO, policies that seriously distorted trade were differentiated from those with minimal trade effects. The two respective categories were labeled "amber" and "green."

What policy analysts in the U.S. will have to deal with is whether spending under the 2002 Farm Bill will exceed our amber box obligations as measured by our Aggregate Measures of Support. According to U.S. Agriculture Secretary Ann Veneman, "Some in other countries are . . . contending that this Farm Bill undermines our international trade position. The WTO permits the United States to spend \$19.1 billion annually for certain types of farm program support. . . the new Farm Bill does meet our trade obligations and the Congress provided a circuit breaker to assure that that will continue to be the case." (see Veneman, USDA).

That said, it is not clear whether U.S. farm policy under the new Farm Bill will remain within our WTO budget ceiling. A USDA report released just before passage of the 2002 Farm Bill by the Economic Research Service noted that, "U.S. support under current farm programs is expected to remain below its ceiling (amber box commitments under the WTO) but any increases in support under new programs, if not carefully crafted to utilize

¹³ For more information on the economics of MPC's, see Bailey June 2002, and Bailey November 2001.

exemptions, could present a problem for compliance with the URAA (or WTO) commitments.” (see USDA/ERS, 2002).

Conclusions

One can reach a number of conclusions regarding the future direction of the U.S. dairy industry. They are as follows.

Regardless of policy incentives, the U.S. dairy industry will continue to restructure as we move into the future. That means dairy producers will continue to be under market pressure to modernize and restructure their businesses to become more competitive. The same is also true for cooperatives, proprietary processors, and retailers. All will have to continue to focus on meeting the needs of consumers.

The U.S. remains committed to the ideals of eliminating export subsidies, providing open market access to other countries, and a reduction in domestic support levels. For dairy policy, these ideals were reflected in a gradual reduction in the milk support price, and in USDA’s effort to reform and modernize federal milk marketing orders and create market oriented incentives for dairy producers to improve milk quality.

At the same time, the U.S. imposed tariffs on steel and lumber, increased domestic spending on the 2002 Farm Bill, passed and implemented the Northeast Interstate Dairy Compact, and created a new dairy deficiency payment program. It is clear that U.S. dairy policy, and in fact agricultural policy in general, will continue to flip flop between market orientation and government intervention for the foreseeable future. The only one principle that has remained consistent in recent years is that the U.S. government does not want to get involved in supply control and/or quotas.

A final thought is in regards to imbalances of fat and nonfat solids in the U.S. That imbalance will potentially get worse over time. The USDA currently has just over a billion pounds of nonfat dry milk in government warehouses that were purchased under the dairy price support program. Those inventories are likely to grow as USDA purchases product each and every week, and there are no feasible plans to reduce this inventory. At the same time, the U.S. continues to import milk proteins in the form of MPC’s. Imports of butter grew significantly in 2001 due to rising U.S. wholesale butter prices, and imports of butter blends are on the rise so far this year. This is occurring as commercial U.S. butter inventories grow.

It will continue to be difficult to balance the needs of supporting farm milk prices with the dairy price support program, while maintaining open access for dairy imports at declining tariff rates over time. Add to this problem expansion in large dairy herds in the U.S., and reduced per capita consumption for cheese, fluid milk and nonfat dry milk. The result is, you have a big problem.

In the final analysis, U.S. dairy producers, processors, and consumers will ultimately depend on the marketplace to make sense of all this.

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